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Vaccine Education and Compliance Statistics in the Greater Indianapolis Area

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Vaccine Education and Compliance Statistics in the Greater Indianapolis Area

A Thesis

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and

The Honors Program

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Butler University

In Partial Fulfillment of the Requirements for Graduation Honors

Matthew Brennan Budi

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Vaccine Education and Compliance Statistics around the Greater Indianapolis Area

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Background: Recently, rates of certain vaccine-preventable diseases have increased and outbreaks have occurred. For example, in 2014, the incidence of measles in the United States reached a record high since 2000, with 644 total cases reported to the Centers for Disease Control and Prevention's (CDC's) National Center for Immunization and Respiratory Diseases. Increases such as this may likely be due to widespread public fears that vaccines can cause serious adverse events. Therefore, due to their accessibility, pharmacists can play a crucial role in lessening these public fears through proper education.

Study objective: The primary objective of this study was to dispel rumors of vaccination and educate the Indianapolis public about the benefits of receiving vaccines. The secondary objective was to assess knowledge of and compliance to certain vaccines among different subpopulations to determine susceptible groups. Barriers to receiving vaccines were examined then analyzed.

Methods: A blinded interactive survey, available online from October 20, 2014 to January 12, 2015, was used to meet the study objectives. It was open for persons aged 18 years or older to respond at their will after watching an educational video also posted online. Vaccination rates, knowledge of personal vaccine history, and responses as to why subjects were not up-to-date with their vaccines were collected. These descriptive statistics were then analyzed to determine trends among these groups.

Results: Fifty responses were collected. The population contained thirty-four females and sixteen males, and age groups ranged from 18-29 years to 60-64 years. After taking an educational survey, thirty-six subjects (72%) claimed that they were up-to-date with their recommended vaccines, one person (2%) was not sure if he was up-to-date or going to seek vaccination, and twelve (24%) subjects were not up-to-date with their recommended vaccines. Of these twelve subjects, nine (75%) were not interested in seeking vaccination, and three (25%) stated that they were interested in determining if they needed to receive vaccines. All three of these subjects claimed that the educational survey aided in their decision to seek vaccination. The nine subjects not interested in seeking vaccination had relatively strong opinions against vaccines.

Conclusion: Despite the small number of respondents, this survey shows trends that may be consistent with the general population. All respondents who were unsure or knowingly not up-to-date with their recommended vaccines and also open to receiving vaccination stated that the educational survey inspired them to determine if further vaccination is needed. On the other hand, all respondents who were unsure or knowingly not up-to-date with their recommended vaccines and also not open to receiving vaccines were avidly anti-vaccine. This study shows that a pharmacist is able to influence a substantial portion of the population who is open to receiving vaccines. However, for those who have strong predisposed biases against vaccination, a pharmacist's influence may likely hold less merit.

BACKGROUND

Vaccine-preventable diseases that lead to death or hospitalization create an unnecessary public health burden in the United States. Approximately 50000 adults in the United States die from vaccine-preventable diseases or complications from these diseases each year.[1] Pharmacists can be advocates for vaccination in more ways than just administration. As pharmacists can readily provide patient education, consultation, vaccine referral to other healthcare providers, and vaccine administration, the role of a pharmacist in vaccine administration is more crucial now than it has ever been. However, despite pharmacists' availability to the general public, rates of certain vaccine-preventable diseases have increased and outbreaks have occurred. In 2012, 48277 cases of pertussis and 20 pertussis-related deaths were reported to the Centers for Disease Control and Prevention (CDC).[2] By comparison, in 2011, 15216 cases were reported.[3] In addition, influenza and pneumonia, two diseases that are largely preventable through vaccination, are the eighth leading cause of death in the United States.[1] Despite the high incidence and severity of these diseases, vaccination rates for pneumococcal disease and influenza have fallen below the Healthy People 2020 goal of 90% established by the U.S. Department of Health and Human Services.[1] Approximately 20% of adults 60 years and older have reported receiving the shingles vaccine, and recent outbreaks of measles and mumps reported from 2012 to February 2015 indicates an increasing need for vaccination awareness and education for multiple vaccines.[4,5] Due to the relative ease of international travel, people residing in the United States need to maintain continued adherence in keeping an up-dated immunization record, as several vaccine-preventable diseases are endemic in other regions of the world.

NEED FOR THE STUDY

With recent rumors and myths of the high incidence and severity of the adverse effects associated with vaccines, fewer people are seeking immunization. Unfortunately, despite numerous studies refuting claims that vaccines cause these adverse effects, many people still believe these claims to be true.[6] This lack of vaccine adherence makes individuals vulnerable to contracting vaccine-preventable diseases, and it also exposes other susceptible persons. This study will focus on the following vaccine-preventable diseases:

Influenza

According to the CDC, 2013-2014 influenza vaccination data shows that only about 42.2% of adults 18 years of age and older were vaccinated. Upon further examination, the lowest reported rate of vaccination within the adult population was adults 18-49 years of age, only achieving a 32.3% vaccination rate. With increasing age, the reported rate of vaccination increased, with adults 65 years and older reporting a vaccination rate of 65%.[7] Furthermore, with the somewhat recent 2009 H1N1 epidemic, the CDC estimates that 43 million to 89 million people were infected in the United States, and the outbreak caused up to 18300 deaths.[8]

Pertussis

Of the 20 pertussis-related deaths that were reported to CDC in 2012, most occurred in infants less than 3 months of age. The CDC reports that "As of December 31, 28660 cases of pertussis were reported to CDC during 2014, and this number is expected to increase as case counts are reconciled."[2]

Pneumococcal Disease

Pneumococcal disease can be quite common and devastating. *Streptococcus pneumoniae* accounts for one-third of all community-acquired pneumonia cases and one-half of all hospital-acquired pneumonia cases.[8] On average, about 175000 hospitalizations occur in complication from pneumococcal pneumonia in the United States each year. Furthermore, infection from *Streptococcus pneumoniae* is a common complication of influenza and measles infection, and it carries a 5-7% fatality rate, with increasing incidence in the elderly. Additionally, pneumococcal "bacteremia occurs in about 25%–30% of patients with pneumococcal pneumonia," and the fatality risk of pneumococcal bacteremia ranges from 20% to 60%, again with increased risk in the elderly.[9] Overall in 2009, 5000 deaths from *Streptotoccus pneumoniae* were reported.[8] Since pneumococcal disease can arise as a complication of other vaccine-preventable diseases, this showcases the importance of maintaining an up-to-date vaccination profile for all immunizations across the board.

Measles

Prior to the advent of the measles vaccine, nearly every person in the United States became infected with measles, and the incidence of the disease was about 500000 new cases each year. With routine vaccine administration, incidence declined to its lowest point of 37 new cases in 2004. However, due to the lack of measles vaccination in certain areas, many individuals are still vulnerable to the virus, as evident in the measles outbreaks that have occurred in recent years.[8] The CDC reports that "Pockets of unvaccinated people can [even] exist in states with high vaccination coverage, underscoring considerable measles susceptibility at some local levels.."[10] This further showcases that, in a world in which international travel can be done with relative ease,

continued vaccine adherence is crucial in maintaining low incidence of vaccine-preventable disease outbreaks.

Mumps

A few hundred people in the United States are reported to contract the mumps virus each year. Before advent of the mumps vaccine, about 186000 new cases of mumps were reported yearly in the United States. This decline in the rate of development of mumps represents a more than 99% decrease in incidence. However, in recent years, mumps outbreaks have occurred. A major risk factor that can predispose susceptible individuals to the mumps virus is residing in a crowded environment. This is why outbreaks have occurred on several college campuses. According to the CDC, in 2014, 1151 people in the United States have been reported to have mumps. This is almost three-times higher than the reported incidence of 438 people in 2013.[11]

Rubella

According to the CDC, the incidence of rubella disease in the United States was less than 10 persons per year from 2009 to 2011.[3] Though rubella disease should not be disregarded, because of the relatively low incidence reported in this time period, this vaccine-preventable disease will not be discussed. However, it should be noted that immunity to the rubella virus is imparted through receipt of the MMR vaccine, which is currently the only vaccine available to provide coverage against the measles and mumps viruses.

Herpes Zoster (shingles)

According to the CDC, approximately 99.5% of people 40 years of age and older who have been born in the United States have been infected with wild-type varicella virus.

Because the rate of reactivation of the wild-type varicella virus is more common than the attenuated virus in the vaccine, all persons older than 40 years of age in the United States are at risk of developing herpes zoster, especially as their age increases. It appears that a person's risk for development of herpes zoster increases as varicella cell-mediated immunity declines. This decline in immunity may result from increasing age, which is evident in comparing the overall incidence of zoster infection (0.4%) to its incidence in persons aged 60 years and older (1%). Though the absolute incidence of infection is relatively low, the relative rate of increase is more than double. Furthermore, incidence of infection is rather high when examining numbers across the entire United States population, as the CDC reports that "There are an estimated one million cases of herpes zoster in the United States annually." Additional risk factors that can contribute to susceptibility of zoster infection may be addition of medications that suppress the immune system and/or increasing numbers of medical conditions, both of which are more likely to occur with increasing age.[12] With reported vaccine compliance of only 20.1% in adults aged $\geq$ 60 years in 2012, it is important to advertise the benefit of vaccination to eligible individuals.[13]

OBJECTIVE

The primary objective of this study was to educate the public around the greater Indianapolis area of the benefits of being adherent to vaccination against pertussis, influenza, pneumococcal disease, shingles, measles, and mumps. The secondary objective of this study was to determine knowledge of and compliance to the vaccines examined between different subpopulations to determine susceptible groups.

METHODS

Data Source

This study utilized a cross-sectional design. It was conducted via an interactive online survey system, called SurveyMonkey. The study was advertised through online messages sent to the Butler University community from the Butler University PR department and also via email to students enrolled in the Butler University College of Pharmacy and Health Sciences. Despite advertisement to only the Butler University community, the survey was open to the general public from October 20, 2014 to January 12, 2015. Respondents within 50 miles of the greater Indianapolis area were asked to take the survey after watching an educational video posted online, at YouTube.com. The population was encouraged to respond, as the survey questions were designed to simultaneously educate them on vaccines that they were eligible for receiving. The data collected was deidentified. If respondents knew they did not receive particular vaccines or if they were unsure of they received a particular vaccine, they were asked if they were interested in seeking or asking about receipt of those vaccines. For persons resistant to receiving vaccines, variables that posed as barriers to vaccination were examined.

Study Population

The population surveyed consisted of individuals 18 years of age and older that resided within a 50 mile radius of the greater Indianapolis area. Participants meeting these criteria were asked to take the survey after they watched an educational video online. The population contained thirty-four (68%) females and sixteen (32%) males. Forty (80%) participants were aged 18-29 years, one (2%) participant was aged 30-34 years, three (6%) participants were aged 40-44 years, one (2%) participant was aged 45-49 years, two (4%) participants were aged 50-54 years, one (2%) participant was aged 55-59 years, and

2 (4%) participants were aged 60-64 years. Thirteen (26%) respondents reported having received advanced graduate training, a PhD, or another professional degree (PharmD, MD, JD, etc.), one (2%) respondent reported receiving a master's degree, seven (14%) respondents reported receiving a bachelor's degree, 25 (50%) respondents reported receiving some college education, an associate's degree, or trade school education, and four (8%) respondents reported completing high school or receiving a GED as their highest level of education.

Sex	N (%)
Female	34 (68)
Male	16 (32)

Age Range	N (%)
18-29	40 (80)
30-34	1 (2)
40-44	3 (6)
45-49	1 (2)
50-54	2 (4)
55-59	1 (2)
60-64	2 (4)

Highest Education Level	N (%)
Advanced Graduate Training (PharmD, MD, JD, etc.)	13 (26)
Master's Degree	1 (2)
Bachelor's Degree	7 (14)
Some College, Associate's Degree, Trade School	25 (50)
High School, GED	4 (8)

Fig.1 Basic respondent demographic data

Exclusion Criteria

To avoid skewed results and inaccurate data, the following subpopulations were excluded from the study:

- Respondents who did not watch the educational video
- Persons diagnosed with asplenia or who had spleen problems
- Persons diagnosed with sickle cell disease
- Persons diagnosed with memory impairment or who had memory problems

- Persons who considered themselves as 'immunosuppressed' or who were on immunosuppressant medications at certain doses that would make them immunosuppressed
- Persons younger than 18 years of age
- Persons enrolled in a prison
- Persons who felt dependent on alcohol or illegal drugs to function with daily activities
- Persons who lived more than 50 miles outside of the greater Indianapolis area
- Persons with a known allergy to a vaccine or a component of it, which would prevent them from receiving any preparation of that particular vaccine

These criteria were disclosed to each respondent in a pre-survey disclaimer, found in Appendix.A.

Study Design

A blinded, interactive, cross-sectional survey was used to meet the study objectives. The survey was available online from October 20, 2014 to January 12, 2015. After watching an educational video posted online, the cohort responded to this survey online. The survey contained 26 questions, which assess basic respondent demographics, including age, education level, sex, and concomitant disease states. Based on answers to previous demographic questions, respondents were then directed only to the vaccines they were indicated to receive.

Measurement of Variables

- Dependent
    - Adherence to the vaccines listed in the survey

- If non-compliant or unsure of compliance:
    - Ask about the desire to receive vaccination or learn more about vaccination
        - For people who responded positively:
            - Efficacy of the survey/educational video in prompting respondents to do so
        - For people who responded negatively or 'not sure'
            - What would need to change to make these persons want to receive indicated vaccines [free-response text]

- Independent
    - Sex
    - Age range
    - Highest education level

Statistical Analysis

Study groups were created based the independent variables. Vaccination rates, knowledge of personal vaccine history, the desire to seek future vaccination for people who were not up-to-date or not sure about vaccine status, and responses as to why certain people did not want to seed future vaccination were collected. These descriptive statistics were then analyzed, compared, and contrasted to determine trends within and among the subgroups. The program utilized to determine these analyses was the Statistical Package for Social Sciences version 13.0 (SPSS Inc., Chicago, IL). Post-assessment, barriers to receiving vaccines were examined then analyzed.

RESULTS

Overall compliance

Fifty responses were collected from October 20, 2014 to January 12, 2015. The population contained thirty-four females and sixteen males, and age groups ranged from 18-29 years to 60-64 years. After taking an educational survey, thirty-six subjects (72%) claimed that they were up-to-date with their recommended vaccines, one person (2%) was not sure if he was up-to-date or going to seek vaccination, and twelve (24%) subjects were not up-to-date with their recommended vaccines. Of these twelve subjects, nine (75%) were not interested in seeking vaccination, and three (25%) stated that they were interested in determining if they needed to receive vaccines. All three of these subjects claimed that the educational survey aided in their decision to seek vaccination. The nine subjects not interested in seeking vaccination had relatively strong opinions against vaccines.

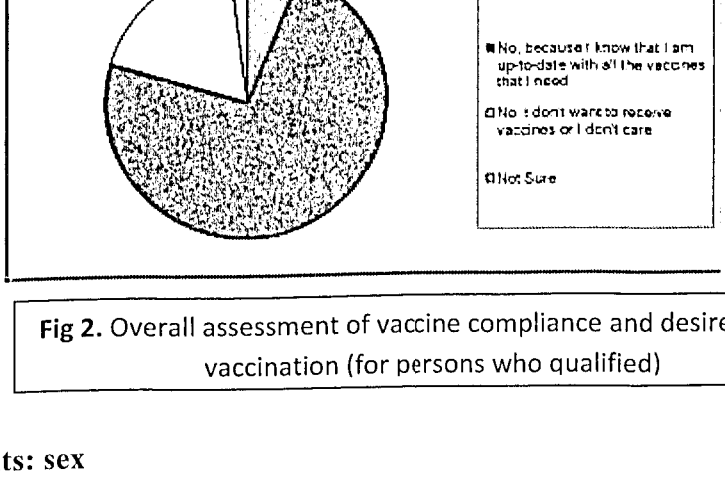

Fig 2. Overall assessment of vaccine compliance and desire to seek vaccination (for persons who qualified)

Subgroup results: sex

Five (14.7%) of the thirty-four female respondents were not up-to-date and not interested in seeking further vaccination after completion of the survey. Furthermore, five (31.3%) of the sixteen male respondents were not up-to-date and either unsure or not interested in seeking further vaccination after completion of the survey. Alternatively, twenty-nine (89.3%) of the thirty-four female respondents and eleven (68.7%) of the sixteen male respondents were either up-to-date or interested in seeking vaccination after completion of the study.

Subgroup results: age

Among all age groups represented in this study (except age 30-34 years), there was at least one respondent in each group that did not want to seek vaccination. Distribution of these responses was relatively equal among groups, with one or two individuals in per age range. Furthermore, of the three total respondents that were not up-to-date with vaccines but interested in seeking vaccination, two were aged 18-29 years and one was aged 60-64 years.

Regarding compliance, thirty-five (87.5%) respondents in the 18-29 year age group, one (100%) respondent in the 30-34 year age group, and one (33.3%) respondent in the 40-44 year age group reported being up-to-date with their vaccines. Though there were only six total respondents in the composite age range of 45-64 years, none of these respondents (0%) reported being up-to-date with their vaccines.

Subgroup results: education level

Of the thirteen total respondents who received advanced graduate education, two (15.4%) persons were not up-to-date and not interested in seeking further vaccination. The one

respondent who reported receiving a master's education was also not up-to-date and not interested in receiving vaccines in the future. Additionally, four (57.1%) of the seven total respondents who received a bachelor's degree were not up-to-date and not interested in seeking vaccination. Of the twenty-five total respondents who reported receiving some college education, an associate's degree, or trade school education, three (12%) reported not being up-to-date and not interested in seeking further vaccination. For the four total respondents who stated that their highest level of education was high school graduation or receipt of a GED, all were either up-to-date or were interested in seeking further vaccination.

Male	11 (68.7)	Advanced Graduate Training (PharmD, MD, JD, etc.)	11 (84.6)
Female	29 (89.3)		
		Master's Degree	0 (0)
18-29	35 (87.5)		
30-34	1 (100)	Bachelor's Degree	3 (42.9)
40-44	1 (33.3)		
45-49	0 (0)	Some College, Associate's Degree, Trade School	22 (88)
50-54	0 (0)		
55-59	0 (0)	High School, GED	4 (100)
60-64	0 (0)		

Fig 3. Sub-populations up-to-date or interested in seeking further vaccination after the study.

Individual vaccine results: influenza

Of the fifty total respondents, thirty-nine (78%) reported receiving or planning on receiving the influenza vaccine, ten (20%) reported not receiving or not wanting to receive the influenza vaccine, and one (2%) responded that he or she was unsure if he or she was going to receive the influenza vaccine.

Individual vaccine results: herpes zoster

Of the two respondents who were 60 years of age or older, one (50%) reported receiving the herpes zoster vaccine, and one (50%) reported not receiving the vaccine.

Individual vaccine results: measles, mumps, and rubella (MMR)

There were six respondents who qualified for receiving only one adult dose of the MMR vaccine. Of these six individuals, two (33.3%) reported receiving a dose of MMR, and four (66.7%) reported not being up-to-date with the MMR vaccine.

Of the forty respondents who qualified for receiving two adult doses of the MMR vaccine, thirty-five (87.5%) reported being up-to-date. In contrast, two (5%) respondents reported not being up-to-date, and three (7.5%) reported being unsure if they were up-to-date with the MMR vaccine series.

Individual vaccine results: Tdap

Of the fifty total respondents for whom the Tdap vaccine was assessed, forty-three (86%) reported receiving a dose of Tdap in adulthood, five (10%) reported not receiving a dose of Tdap in adulthood, and two (4%) respondents reported that they were unsure of their Tdap vaccine status.

Individual vaccine results: pneumococcal (PPSV23 and PCV13)

There were five total respondents who were eligible for receiving the pneumococcal vaccine series in adulthood. Of these five respondents, one (20%) reported being up-to-date with the series. Conversely, the other four (80%) respondents reported not being up-to-date with the series.

Influenza*	39 (78)
Herpes Zoster	1 (50)
MMR (1-dose, 2-doses, respectively)	2 (33.3), 35 (87.5)
Tdap	43 (86)
Pneumococcal	1 (20)

* Reported receiving or planning on receiving the influenza vaccine

Fig 4. Compliance to each individual vaccine, if eligible

DISCUSSION

Per the results of the study, it appears that females are more complaint with their vaccines compared to males, as twenty-nine (89.3%) of the thirty-four female respondents and only eleven (68.7%) of the sixteen male respondents were either up-to-date or interested in seeking vaccination after completion of the study. Additionally, it appears that age holds no correlation to vaccine compliance. With the exception of the 30-34 year age bracket, each age group represented in the study had at least one individual who was not up-to-date and not interested in seeking vaccination. It also appears that education level holds no correlation to vaccine compliance. With the exception of the high school/GED group, there was at least one respondent in each educational group who was not up-to-date and not interested in seeking vaccination. Further, more controlled study with larger populations is needed to determine if these differences are significant or not and if these results are comparable to CDC reports.

The two vaccines that reflected the entire study population were influenza and Tdap. Thus, assessment of adherence rates with these two vaccines likely holds more power in their results compared to the other vaccines studied. Adherence between the two vaccines was relatively similar: 86% of respondents reported being up-to-date with the Tdap

vaccine, and 78% of respondents reported being up-to-date with the influenza vaccine. Similarly, rates of non-adherence between the two groups was similar, with 10% of the study population not being compliant with Tdap and 20% of the study population not being compliant or willing to receive the influenza vaccine. Of note, 4% of respondents and 2% of respondents were unsure if they received or were going to receive the Tdap and influenza vaccines, respectively.

For the MMR vaccine, forty-six total subjects assessed their compliance. Of these, only six qualified for receiving a one-time dose of MMR in adulthood. A majority (66.7%) of these six subjects were not up-to-date with the MMR vaccine. The remaining forty respondents qualified for receiving two doses of the MMR vaccine in adulthood. Compliance in this group was much higher, with 87.5% of subjects within this group reporting being up-to-date. This likely could be a result of the advertisement of the survey to students in Butler University's College of Pharmacy and Health Sciences program, which requires proof of immunity to the measles, mumps, and rubella viruses. The herpes zoster and pneumonia vaccines had a relatively small number of qualifying respondents, so their results will not be discussed at length. However, it should be noted that only one of the five total respondents (20%) reported being up-to-date with the pneumonia vaccine. This should be a primary area of interest for healthcare professionals, as this may likely be the case for the general population, especially since the CDC's pneumococcal vaccine recommendations were recently changed in 2014 for persons older than 65 years of age.

To truly determine significance of these results and if they are comparable to CDC reports., further, more controlled study with larger populations is needed.

Study strengths

A primary strength of this study is that the geographic location of respondents was relatively constant, being within 50 miles of the greater Indianapolis area. Additionally, this study ensured that respondents were properly educated prior to and during administration of the survey. With the questions guiding the subjects, they were only navigated toward assessing vaccines that they were eligible for receiving.

Study limitations

One of the primary limitations of this study was that individuals only knew about the study if they were exposed to internet media. Additionally, only those that were literate (unless directed by a literate individual) were able to take the survey. Furthermore, individuals that did not understand how to navigate through the survey were unable to respond. Thus, this study likely underrepresents populations with a lower education level and those who cannot or do not choose to have internet access or those who have difficulty navigating the internet. Also, because minors were not included in the study, trends of data for individuals less than 18 years of age were not reflected in the study results. Therefore, this study may overlook causative factors for lack of vaccine adherence that exist solely in these younger age groups.

Because this study was open to the general public, it could contain a relatively large amount of selection bias. Whether positive or negative in opinion, people who had a high amount interest in vaccines were probably more likely to respond, especially since the survey required subjects to watch a six-minute video prior to responding. Furthermore, as the study was advertised to students enrolled in the Butler University College of Pharmacy and Health Sciences, selection bias could have also occurred as a result of this.

Though the study examined certain independent variables that could influence a person's compliance to vaccines, several other variables that could influence vaccine adherence were not studied. Additionally, due to a small number of respondents, the independent variables examined may not be indicative of trends within the general population.

CONCLUSION

Despite the small number of respondents, this survey shows trends that may be consistent with the general population. All respondents who were unsure or knowingly not up-to-date with their recommended vaccines and also open to receiving vaccination stated that the educational survey or video inspired them to determine if further vaccination is needed. On the other hand, all respondents who were unsure or knowingly not up-to-date with their recommended vaccines and also not open to receiving vaccines were avidly anti-vaccine. This study shows that, for those who have strong predisposed biases against vaccination, a pharmacist's influence may likely not hold much merit. However, this study also shows that a pharmacist is able to influence a substantial portion of the population who is open to receiving vaccines. With continued diligence in the realm of vaccine practice, pharmacists can continue to solidify their position on the healthcare team and push for provider status.

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APPENDIX.A: Survey Disclaimer

- The answers you give will be used to report vaccination trends in the greater Indianapolis area for the Vaccine Education and Compliance Statistics around the Greater Indianapolis Area research study. Your answering these questions means that you give consent out of your own free choice without undue inducement.
    - 1. Nature and Duration of Procedure
        - The purpose of this study is to educate the public on the benefits of getting vaccines and to dispel the false rumors of the bad effects of vaccines. Additionally, this study will help the researchers learn about your knowledge of your vaccination history and if you are up-to-date in receiving certain vaccines. The study will also help the researchers to identify barriers that prevent certain people from receiving vaccines. Participation in this study is voluntary, but if you choose to respond, you are required to watch an educational video beforehand. A link to this video can be found on the survey disclaimer. It should take about 10 minutes to complete the survey. You will be mostly asked yes or no questions and other questions that require clicking on a circle. You may encounter one question that requires you to type a response. Generally, most questions asked will regard your age, sex, education level, and your medical lifestyle. If at any point in the survey response, you feel that you are offended by a certain question or do not want to respond, you have every right to exit out of the survey and choose not to complete it. Your choosing to stop responding will in no way

affect your relationship with the researchers or Butler University. Upon stopping, your answers will not be saved and will be deleted. If you choose to participate, your answers will be kept confidential (anonymous) and cannot and will not be tracked back to you.

- 2. Potential Risks and Benefits
  - There are no known risks or discomforts associated with this research. There are also no known direct benefits of this research. However, the data that you input will allow the researchers to make decisions, improve their knowledge of, and identify trends that can increase public health when it comes to vaccines.
- 3. Questions Concerning the Study
  - If you have any questions regarding the study or any aspect of it, please contact the thesis preceptor, Kena Lanham, at the following address: 4600 Sunset Avenue Indianapolis, IN 46208. If you desire to take the survey and agree to the Voluntary Willingness to Participate Statement, please check the box below.

- Thank you very much for taking interest in responding to this survey! This survey is designed to educate you about some commonly-received vaccines. The answers you give will help report vaccination trends in the greater Indianapolis area. Please note that by responding to this survey, you agree to the terms and conditions found on the Voluntary Willingness to Participate Statement, which is offered to you by checking the box below. As mentioned in the Voluntary

Willingness to Participate Statement, your answers are anonymous and cannot and will not be tracked back to you.

- To report accurate information, please do NOT respond to this survey if you:
  - Have not yet watched the educational video, found at: http://youtu.be/F1_OJcVChpE
  - Have been diagnosed with asplenia or have spleen problems
  - Have been diagnosed with sickle cell disease
  - Have been diagnosed with memory impairment or have memory problems
  - Are considered 'immunosuppressed' or are on immunosuppressant medications at certain doses that would make you immunosuppressed
  - Are younger than 18 years of age
  - Are currently enrolled in a prison
  - Feel dependent on alcohol or illegal drugs to function with daily activities
  - Live more than 50 miles outside of the greater Indianapolis area
  - Have a known allergy to a vaccine or a component of it, which would prevent you from receiving any preparation of that particular vaccine
- Please check a box below if you are interested in taking the survey and/or would like to view the Voluntary Willingness to Participate Statement.